CS 1555

Lecture 11

**Structured Query Language (SQL) – DML (continued)**

Comment on sorting

- ORDER BY 2 ASC, 1 DESC refers to the relative ordering of the tuple (i.e. the second attribute and the first attribute)

SQL CASE statement & NULL

- Implements if-then-else functionality

- Easy way to handle NULLs

- Simple expression on equality does not work for NULLs (need to use IS NULL/IS NOT NULL)

- Ex: SELECT SID, CASE

WHEN MAJOR IS NULL THEN ‘undecided’

WHEN MAJOR = ‘cs’ THEN ‘good choice’

ELSE ‘recruit’

END AS Strategy FROM…

- Alias for case is optional

- Value of the THEN could be of any type

- ELSE is optional

Two table manipulation

- SELECT [DISTINCT] attribute-list | \*

FROM table1, table2

WHERE join-condition & selection-condition

- Cartesian product: table1 X table2 if no join-condition

- Joint-condition: similar to selection-condition

Join operator

- JOIN was introduced for specifying the join condition in the FROM clause

- table1 JOIN table2 ON join-condition

Natural join

- NATURAL JOIN (without ON-clause)

- Use renaming of attribute if there is a need

- SELECT \* FROM (LIBRARIAN NATURAL JOIN SECTION AS S(SNO, SName, Head)) …

- Natural join over some attributes: USING (attribute-list)

Other join operations

- Outer join operators

- CROSS JOIN

- UNION JOIN

Set operations

- SQL supports UNION, EXCEPT (difference), INTERSECT(not all vendors)

- UNION ALL retains duplicates, UNION does not

- Tables must be union compatible

Merging fields in queries

- String concatenation is denoted by two vertical bars (||)

- || merges one or more strings into a single string

- Ex: SELECT fname || ‘ ‘ || lname AS Name

Range queries and range conditions

- BETWEEN and its negation NOT BETWEEN can be used with numeric, character, and datetime datatypes

- Simplify formulation of conjunction expressions

Partial queries – pattern mataching

- LIKE/NOT LIKE support comparisons with partial strings

- Percent sign ‘%’ indicates a match with an arbitrary number of characters including spaces (\* is not valid)

- Underscore sign ‘\_’ matches a single arbitrary character

- Escape defines the escape character that causes SQL to interpret a wildcard char (%) as itself in a string

- … WHERE Discount LIKE ‘10&%’ ESCAPE ‘&’;

Regular expressions

- SIMILAR TO/NOT SIMILAR TO support complex pattern matches a given string

- Ex: PHONE SIMILAR TO ‘412.6(2|4)%’;

- Lots of metacharacters from POSIX/Postgres documentation to use as reference

Challenging yet common query

- Assume ENROLL(SID, CID, score)

- Find ranking of students in CS2550 according to their scores – should consider case of tie

- Can’t be done yet with what we’ve talked about

Nested queries and set comparisons

- One of the most powerful SQL features

- Two definitions of a set

- Explicit: list members of the set within ()

- Implicit: define it as a subquery

Scalar subquery

- Inner query whose output is single column and single row

- … WHERE SID = (SELECT F.SID FROM STAFF AS F WHERE F.SSN = ‘132-32-2222’;